

**CLAIMS**

What is claimed is:

1. A divergent flap for a convergent/divergent nozzle system comprising:  
a joint structure which defines a hinge axis;  
an outer skin which extends from said joint structure;  
an inner skin which extends from said joint mounting structure; and  
a tip structure which extends from said inner skin and said outer skin, said inner skin and said outer skin defining a multiple of separate cooling channels.
2. The divergent flap as recited in claim 1, wherein each of said multiple of separate cooling channels comprises an intake and an outlet.
3. The divergent flap as recited in claim 2, wherein each of said multiple of intakes congregate toward a longitudinal axis of said divergent flap, the longitudinal axis transverse the hinge axis.
4. The divergent flap as recited in claim 3, wherein said multiple of intakes comprise a first intake located upon said longitudinal axis, a second intake adjacent said first intake and a third intake adjacent said first intake.
5. The divergent flap as recited in claim 4, wherein said second intake and said third intake communicate with a respective angled transition channel.
6. The divergent flap as recited in claim 2, wherein each of said multiple of intakes are located adjacent to said joint structure.
7. The divergent flap as recited in claim 2, wherein each of said multiple of intakes are located through said joint structure.

8. The divergent flap as recited in claim 2, wherein each of said multiple of outlets comprise a set of outlets through said inner skin.

9. The divergent flap as recited in claim 2, wherein each of said multiple of outlets comprise a set of outlets through said tip section.

10. The divergent flap as recited in claim 2, wherein each of said multiple of outlets is located between said inner skin and said outer skin.

11. A convergent/divergent nozzle system comprising:
  - a plurality of convergent flaps positionable across a range of angular orientations;
  - a plurality of divergent flaps pivotably connected to said convergent flaps at a joint structure and positionable across a range of angular orientations, at least one of said plurality of divergent flaps comprises a multiple of cooling channels, each cooling channel comprising an intake adjacent said joint structure and an outlet aft of said joint structure; and
  - a plurality of divergent flap seals intermediate said plurality of divergent flaps, each of said plurality of divergent flap seals at least partially overlapping an adjacent divergent flap to selectively cover and expose at least one of said plurality of intakes in said adjacent divergent flap in response to articulation of said convergent/divergent nozzle system.
12. The convergent/divergent nozzle system as recited in claim 11, wherein each of said divergent flaps comprise a first intake located upon a longitudinal axis, a second intake adjacent to said first intake and a third intake adjacent said first intake.
13. The convergent/divergent nozzle system as recited in claim 12, wherein each of said multiple of intakes are located adjacent to said joint structure to receive a cooling airflow from said plurality of convergent flaps.
14. The convergent/divergent nozzle system as recited in claim 12, wherein each of said multiple of outlets comprise a set of outlets.

15. A method of controlling a cooling flow through a convergent/divergent nozzle system with a plurality of divergent flap seals distributed circumferentially intermediate a plurality of divergent flaps comprising the steps of:

- (1) locating a multiple of cooling channels through at least one of the divergent flaps, each cooling channel comprising an intake and an outlet; and
- (2) selectively articulating the convergent/divergent nozzle between an afterburning and a non-afterburning position to selectively cover and expose at least one of the plurality of divergent flap intakes with at least one of the divergent flap seals to modulate a cooling airflow through the divergent flap.

16. A method as recited in claim 15, further comprises the step of:  
receiving the cooling airflow from a plurality of convergent flaps upstream of said divergent flaps.

17. A method as recited in claim 16, further comprising the steps of:  
articulating the divergent flaps relative a plurality of convergent flaps to change an overlap between the at least one of the plurality of divergent flaps and the at least one of the divergent flap seals to selectively cover and expose at least one of the plurality of divergent flap intakes.

18. A method as recited in claim 16, further comprising the steps of:  
exhausting the cooling airflow from each cooling channel through a set of openings through an inner skin of the divergent flap.

19. A method as recited in claim 16, further comprising the step of:  
exhausting the cooling airflow from each cooling channel between an inner skin and an outer skin of the divergent flap .